



The 33rd International Science Olympiad for Young
Mathematicians, Physicists and Chemists
March 5, 2021



Mathematics - Grade 10

1. Find positive integer solutions to the equation $\frac{x}{3} + \frac{14}{y} = 3$.
2. A positive two digit integer is called „good number“ if it is equal to four times of the sum of its digits. Find all „good numbers“.
3. If a, b, c are positive real numbers and $a + b + c = 1$, then
$$\left(\frac{1}{a} - 1\right)\left(\frac{1}{b} - 1\right)\left(\frac{1}{c} - 1\right) \geq 8.$$
 Proof its.
4. Solve the equation $\sqrt{x^2 - 6x + 9} + \sqrt{x^2 + 8x + 16} = 7$.
5. Parallelogram $ABCD$ is given. The bisectors of $\angle A$ and $\angle D$ meet at E on the side BC . Find the angle AED .